REMARKS

Claims 1–7 and 13–19 are pending in the application. In the Office action dated February 6, 2009, claims 1–7 and 13–19 were rejected. In view of the following remarks, Applicants respectfully request reconsideration of the rejected claims. Applicants believe no fees are now due. Please charge any additional fees required, or credit any overpayments, to our Deposit Account No. 11-1540.

Rejections under 35 U.S.C. § 112

Claim 17 is rejected under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

In particular, claim 17 recites "producing the oxide superconductor by partial melting and solidifying the precursor in said state; wherein the solidified portion is not an oxide superconductor". The Examiner asserts that it is not clear how an oxide superconductor can be produced and still not be an oxide superconductor. Applicants respectfully disagree.

The question of whether or not the language of a claim complies with 35 U.S.C. § 112, second paragraph is whether or not the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Furthermore, the definiteness of the claim must be considered in light of the content of the specification, the teachings of the prior art, and the claim interpretation that would be given by one of ordinary skill in the art.

Claim 17, as currently pending, is directed to the oxide superconductor of claim 13, which recites an RE-Ba-Cu-O based oxide superconductor, where the oxide superconductor includes a portion solidified after melting and exposed to the outside, where the solidified portion contains one or both of Ba and Cu, but does not contain a rare earth element. The solidified portion is generated by a molten reaction between a precursor of the RE-Ba-Cu-O superconductor and a substrate material which is used to support the precursor when the

precursor is melted and solidified. Applicants respectfully suggest the subject matter of claim 13 is definite and unambiguous.

Claim 17 further specifies the method used to prepare the oxide superconductor of claim 13. Specifically, claim 17 is directed to an oxide superconductor produced by placing the precursor of the oxide superconductor on the substrate material containing pure metal or a compound which is meltable in the precursor when the precursor is partially molten. The oxide superconductor is then prepared by partially melting and then solidifying the precursor in said state; wherein the solidified portion is not an oxide superconductor.

As is clear in claim 13, the "solidified portion" does not correspond to the oxide superconductor. Specifically, the "solidified portion contains one of or both of Ba and Cu but does not contain a rare earth element and the solidified portion is generated from a molten reaction between a precursor of the RE-Ba-Cu-O superconductor and a substrate material which is used for supporting the precursor when the precursor is melted and solidified."

The oxide superconductor object claimed in Claim 17 has, as well as (i) a portion which is an oxide superconductor generated by partial melting and solidifying a precursor, (ii) a solidified portion which is not an oxide superconductor even after the steps of partial melting and solidifying. The solidified portion results from the reaction of the substrate material with the oxide superconductor precursor. Applicants suggest the subject matter of claim 17 is particularly and definitely described.

Furthermore, the specification is unambiguous in describing the process recited in claim 17. The initial configuration of the oxide superconductor precursor and the substrate material is shown in Fig. 1, and described in the specification at page 19, lines 2 to 8. The resulting oxide precursor is shown in Fig. 2, and the physical and chemical processes that produce the oxide superconductor are described at page 27, lines 3–23. As described therein, even when the substrate material melts, it does not contaminate the superconductor precursor.

In view of the above remarks, and the teaching of the specification, Applicants respectfully suggest that one of ordinary skill in the art of oxide superconductor synthesis would be made well-aware of the metes and bounds of claim 17, and that therefore the language of claim 17 particularly defines the claimed subject matter. Applicants therefore respectfully request the withdrawal of the rejection of claim 17 under 35 U.S.C. § 112, second paragraph.

Rejections under 35 U.S.C. § 103

The Examiner has rejected claims 1–7, 18, and 19 under 35 U.S.C. § 103(a) as being unpatentable over Iida et al. (U.S. Patent no. 7,001,870).

Claims 1–7 and 13–16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Murakami (U.S. Patent no. 5,521,150).

The Examiner has asserted that the present claims would have been obvious to one of ordinary skill in the art over the teachings of Iida et al, as the reference is directed to a process of melt processing to produce an oxide superconductor by placing a meltable compound on the superconductor, followed by melting and solidifying the same. Applicants respectfully disagree.

Additionally, the Examiner asserts that Murakami discloses every element of the claimed invention, except for teaching that the superconductor precursor is placed on the substrate. The Examiner further asserts that as the reference teaches that adding the substrate to the precursor, it would have been obvious to one of ordinary skill to turn the structure over to put the precursor on the substrate rather than vice versa. Applicants respectfully disagree.

The Iida et al. reference is directed to a method for joining rare-earth oxide superconductors together using a solder, such that the superconductors will be strongly coupled, and there will be no resulting segregation of impurities and pores in the joined portion (see col. 3, lines 35–53). In other words, Iida et al. is concerned with joining existing portions of oxide superconductor to make larger pieces of oxide superconductor. Iida et al. is not directed to the preparation of oxide superconductors from precursor materials.

Similarly, Murakami is directed to a method of joining oxide superconductors by a melting process under pressure. The preparation of the oxide superconductor is described, for example, in Example 1 of Murakami (col. 3, lines 21–54), and involves mixing various metal oxides, melting them, rapidly cooling them, and pulverizing the resulting solid. After the addition of silver oxide, the precursor powder is heated to 1100 °C, then cooled and subjected to crystal growth. It is the oxide superconductors prepared by this process that are then joined together using the process of Murakami.

The present application is not directed at joining bulk superconductor. Instead, the Applicants have provided a solution to an existing problem of crack formation when preparing oxide superconductors (see page 1, lines 12 to page 8, line 14). More particularly, the application is directed to "a technology which enables a production of a large, bulk-shaped oxide superconductor that is free of defects, wherein cracks which are caused by a difference in the coefficients of thermal expansion between an oxide superconductor and a support member are not formed when a production of an oxide superconductor is carried out using a partial melting and solidification methods" (page 7, line 20 to page 8, line 2).

The references cited by the Examiner are directed to processes distinct from that of the present claims. Both Iida and Murakami disclose methods for joining existing oxide superconductors, while the rejected claims are directed to the production of an oxide superconductor using an oxide superconductor precursor. Applicants respectfully suggest that an oxide superconductor is distinct from a precursor of an oxide superconductor.

A superconductor precursor is a material wherein crystal growth has not occurred to create superconductivity in the material. That is, a precursor of an oxide superconductor becomes an oxide superconductor after crystallization. The temperature required for crystallization depends on a number of variables, such as the kind and composition of the precursor used. A practitioner having ordinary skill in the art would well understand that a

precursor of an oxide superconductor is not the oxide superconductor itself, but becomes an oxide superconductor due to crystallization thereof.

Furthermore, a practitioner of ordinary skill in the art would be well-able to appreciate the advantages of the claimed invention, that of permitting oxide superconductors to be formed without cracks forming due to incompatibilities between the oxide superconductor and the substrate upon which it undergoes crystallization.

The cited references disclose distinctly different processes than are recited by the rejected claims. As discussed in their previous response, Applicants suggest that neither Iida nor Murakami teach or suggest either:

(I) That a precursor of an oxide superconductor is placed on a substrate material, which contains a pure metal or a compound which is meltable in the precursor when the precursor is partially molten; or

(II) That an oxide superconductor is produced by partial melting and solidifying the precursor placed on an appropriate substrate material.

As neither Iida et al. nor Murakami disclose each and every element of the claimed invention, and as neither Iida et al. nor Murakami provide any suggestion to fundamentally change the nature of the disclosed inventions so as to arrive at the claimed invention, Applicants therefore suggest that the Examiner has failed to establish the *prima facie* obviousness of claims 1 and 13. 1–7 and 13–16. Accordingly, Applicants respectfully suggest that claims 1 and 13 are be allowable. As all the rejected dependent claims depend from claim 1 or claim 13, Applicants suggest that they are allowable for at least the reasons provided for claims 1 and 13. In view of the above comments, Applicants respectfully request that the rejection of claims 1–7 and 13–16 under 35 U.S.C. § 103 be withdrawn.

Obviousness-Type Double Patenting

Claims 1–7, 18, and 19 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1–11 of U.S. Patent no. 7,001,870 (Iida et al.).

The Examiner asserts that the claims are not patentably distinct from each other because the claims of Iida et al. are directed to a method for producing an oxide superconductor by melt processing. Applicants respectfully disagree.

For at least the reasons provided above in distinguishing the rejected claims over Iida et al. and Murakami, Applicants suggest that claims 1–11 of Iida et al., which are directed exclusively at a method for joining existing oxide superconductors, does not render the claimed subject matter obvious, as the rejected claims are directed to the preparation of an oxide superconductor from an oxide superconductor precursor.

In view of the above remarks, Applicants respectfully request the withdrawal of the rejection of claims 1–7, 18, and 19 under the doctrine of nonstatutory obviousness-type double patenting.

Applicants suggest that the claims are now in condition for allowance. If there are any questions regarding this paper, or if a telephone conference would prove helpful, the Examiner is encouraged to contact the undersigned agent.

CERTIFICATE OF E-FILING

I hereby certify that this correspondence is being transmitted electronically via the United States Patent and Trademark Office's EFS-Web System on May 6, 2009.

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